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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/601,004	09/11/2000	Kazuo Toraichi	A-371	4200

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EXAMINER	
DO, CHAT C	

ART UNIT	PAPER NUMBER
2124	6

DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PRL

Office Action Summary	Application No. 09/601,004	Applicant(s) TORAICHI ET AL.	
	Examiner Chat C. Do	Art Unit 2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *9/11/00;8/11/00;10/4/00;10/24/00* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 September 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on September 11 2000. It is noted, however, that applicant has not filed a certified copy of the 10-27770 application as required by 35 U.S.C. 119(b).

Oath/Declaration

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:
It does not include the notary's signature in English.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because the abstract exceeds 150 words in length. Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities:

In page 2 line 9, the phrase "FIG. 10," should change to "FIG. 8,".

Appropriate correction is required.

Claim Objections

6. Claims 4-5 are objected to because of the following informalities: claims 4-5 are missing the period (.) at the end of claims. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, the limitation "values of a local support" in lines 6-7 is unclear to the extent that no reasonable interpretation can be given for examination purposes. In addition, the phrase "can be" in lines 5-6 renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d). For examination purposes, the examiner considers the sampling function is capable of differentiating but may or may not use in the claim.

Re claim 2, the limitation "the whole region" in line 3 lacks an antecedent basis. For examination purposes, the examiner considers this limitation as "a whole region". In

addition, the phrase "can be" in line 3 renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d). For examination purposes, the examiner considers the sampling function is capable of differentiating but may or may not use in the claim.

Re claim 3, the limitation "H(t)" in line 4 lacks an antecedent basis. For examination purposes, the examiner considers this limitation as the sampling function.

Re claim 6, the limitation "t" in line 10 lacks an antecedent basis. For examination purposes, the examiner considers this limitation as time domain.

Re claim 7, it has the same problem as cited in claim 6. Thus, claim 7 is also rejected under the same rationale in the rejection of rejected claim 6.

Thus, claims 4-5 are also rejected for being dependent on the rejected claims.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claims 1-5 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-5 clearly recite a system for calculating the approximation data by interpolation according to a mathematic algorithm. In order for such a claimed system to be statutory, the claims must include either a step, means, or process that results in a physical transformation outside the computer or a limitation to a practical application. However, it is clear from the claims that the claims merely recite step or non-specific

means or process for data computation and manipulation in performing a mathematical function. The inputs are numbers and outputs are also numbers. The claims fail to recite any step or means that results in a physical transformation outside the computer, that includes a limitation to a practical application, or that requires a specific computer to implement the claimed process. Therefore, claims 1-7 are clearly directed to a non-statutory subject matter.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Masaru et al. ("A Smooth Signal Generator Based on Quadratic B-Spline Function").

Re claim 1, Masaru et al. discloses a two variable data interpolation system (Introduction section lines 16-18 page 1252 and Preliminaries section lines 1-5 page 1252) wherein a value between a plurality of discrete data is interpolated by performing convolution operation (equations 1-6 page 1252) corresponding to the plurality of discrete data positioned at equal intervals in a two-dimensional space (Preliminaries section lines 1-7 page 1252) using a sampling function that can be differentiated finite times and has values of a local support (Figure 1 and left column lines 1-4 page 1253).

Re claim 2, Masaru et al. further discloses the sampling function is a function that can be differentiated only once over the whole region (Figure 1 and equations 17-18).

Re claim 3, Masaru et al. further discloses the sampling functions is defined as $H(t) = -F(t+.5)/4 + F(t) - F(t-.5)/4$ (equation 1 the summation function).

Re claim 4, Masaru et al. further discloses the third order B spline function F(t) is expressed as in page 17 lines 4-6 of application (equation 2).

Re claim 5, Masaru et al. further discloses the sampling function is defined as in pages 17-18 lines 3-9 of application (carry-out multiplication and summation process in equation 4).

Re claim 6, Masaru et al. further discloses the two variable data interpolation system comprising a discrete data extracting unit (Introduction section lines 1-10 page 1252) for extracting a plurality of discrete data that exist within a predetermined range around a data interpolating position that becomes an object of interpolation operation; sampling function operating unit (Preliminaries section) for calculating a value of the sampling function H(t) for each of a plurality of discrete data extracted in this manner, with letting distance between the data interpolating position and discrete data be t; and convolution operating unit (equations 4-5) for obtaining a value of the data interpolating position by performing convolution operating though adding values of the sampling function that are calculated by the sampling function operating unit and correspond to the plurality of discrete data respectively.

Re claim 7, it has the same limitations cited in claim 6. Thus, claim 7 is also rejected under the same rationale in the rejection of rejected claim 6.

13. Claims1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueda (U.S. 5,204,624).

Re claim 1, Ueda discloses in Figures 2-3 a two variable data interpolation system wherein a value between a plurality of discrete data is interpolated by performing convolution operation (abstract) corresponding to the plurality of discrete data positioned at equal intervals (Figures 2A-2C) in a two-dimensional space using a sampling function (3 of Figure 3) that can be differentiated finite times (abstract lines 8-10) and has values of a local support.

Re claim 2, Ueda further discloses the sampling function is a function that can be differentiated only once over the whole region (abstract lines 8-10).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claims 3-7 are rejected under 35 U.S.C. 103(a) as being obvious over Ueda (U.S. 5,204,624) in view of Masaru et al. ("A smooth Signal Generator Based on Quadratic B-Spline Functions").

Re claims 3-5, Ueda does not disclose the sampling functions is defined as $H(t) = -F(t+.5)/4 + F(t) - F(t-.5)/4$ wherein F(t) is the third order B spline function F(t)

expressed as in page 17 lines 4-6 and the overall sampling function is defined as in pages 17-18 lines 3-9. However, Masaru et al. disclose in the sampling functions is defined as $H(t) = -F(t+.5)/4 + F(t) - F(t-.5)/4$ wherein F(t) is the third order B spline function F(t) expressed as in page 17 lines 4-6 and the overall sampling function is defined as in pages 17-18 lines 3-9 (Preliminaries section page 1252). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to utilize the Masaru's sampling function including the third order B spline function in the Masaru et al.'s interpolation system because it would enable to compute the approximate data in an interpolation system smoothly and reduce the complexity of the interpolation system.

Re claim 6, Ueda further discloses in Figure 3 the two variable data interpolation system comprising a discrete data extracting unit (2) for extracting a plurality of discrete data that exist within a predetermined range around a data interpolating position that becomes an object of interpolation operation; sampling function operating unit (3) for calculating a value of the sampling function H(t) for each of a plurality of discrete data extracted in this manner, with letting distance between the data interpolating position and discrete data be t; and convolution operating unit (4) for obtaining a value of the data interpolating position by performing convolution operating though adding values of the sampling function that are calculated by the sampling function operating unit and correspond to the plurality of discrete data respectively (5).

Re claim 7, it has the same limitations cited in claim 6. Thus, claim 7 is also rejected under the same rationale in the rejection of rejected claim 6.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. U.S. Patent No. 4,876,509 to Perlmutter discloses an image restoration process for magnetic resonance imaging resonance imaging.

b. U.S. Patent No. 6,018,597 to Maltsev et al. disclose a method and apparatus for changing or mapping video or digital images from one image density to another.

c. U.S. Patent No. 6,411,238 to Koyanagi et al. disclose a digital to analog converter with step voltage generator for smoothing analog output.

d. U.S. Patent No. 5,481,583 to Heuscher discloses a higher order preinterpolator for backprojection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (703) 305-5655. The examiner can normally be reached on M => F from 7:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (703) 305-9662. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Chat C. Do
Examiner
Art Unit 2124

April 18, 2003

KAKALI CHAKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100